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National Defence

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Deputy Minister

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The Minister

CF-18 ESTIMATED LIFE EXPECTANCY: ACTIVITIES AND COST ESTIMATES

Enclosed is a briefing note to provide you with outlines on activities and cost estimates associated with the currently approved plan to retire the CF-18 fleet in 2015 and the incremental activities and costs associated with a delayed fleet retirement to 2032. The feasibility of an increase in mission readiness rates is also discussed.

John Forster

Enclosures: 2

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BRIEFING NOTE FOR MINISTER OF NATIONAL DEFENCE

CF-18 ESTIMATED LIFE EXPECTANCY: ACTIVITIES AND COST ESTIMATES

ISSUE

1. This Briefing Note outlines the activities and cost estimates associated with the currently approved plan to retire the CF-18 aircraft gradually from 2021 to 2025 and, the incremental activities and costs associated with delaying the retirement of the aircraft to cover the period 2027 to 2032. The new predicted retirement dates of aircraft within this fleet would be synchronized with the employment of interim aircraft and the arrival of the permanent fleet to maximize the availability of mission ready aircraft (legacy, interim and permanent replacement). The feasibility of an increase in mission readiness rates of the CF-18 from is also discussed.

BACKGROUND

2. Historical annual sustainment expenditures for the CF-18 fleet have been approximately \$150 million. Incremental costs of \$404 million beyond this baseline were identified in 2014 as part of the decision to extend the fleet Estimated Life Expectancy from 2020 to 2025. Estimated Life Expectancy refers to the year when the last aircraft of a fleet is retired. Further analysis conducted in 2016 has identified activities and associated investments that could further extend the Estimated Life Expectancy and also increase mission readiness.

DISCUSSION

3. Estimated Life Expectancy 2025 (\$404 million): The current CF-18 Estimated Life Expectancy was extended from 2020 to 2025 in September 2014 meaning that the aircraft would be gradually retired from 2021 to 2025 during the transition to a permanent replacement fleet. The incremental cost was estimated at a rough order of magnitude cost of \$404 million. The analysis of the procurement options to replace the CF-18 fleet, demonstrated that this extension is required regardless of the option chosen. We have commenced initial orders of materials to extend the CF-18, however, no funds associated with the \$404 million have been spent to date. Approximately is expected to be spent during fiscal year 2017-18. The \$404 million breakdown is as follows:

- a. Structural work : This investment will be added to the structural work that started over a decade ago and will consist of conducting inspections and repairs to more aircraft (up to the entire fleet of 77 aircraft). Some of the incremental funds will be spent next fiscal year.
- b. Sustainment : Consists of additional spare parts and obsolescence management activities. As aircraft systems age they tend to break more often, requiring more spare parts and maintenance. Also, as the global F/A-18 fleet size reduces some companies may stop supporting manufacturing and/or repair & overhaul activities, leading to parts obsolescence.

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- c. Interoperability and Regulatory Upgrades (Capital): Under the Estimated Life Expectancy 2025 planning assumptions, the CF-18 was to begin retirement in 2021 as a transition to a replacement fighter took place. Therefore, CF-18 operational capability improvements were limited to only those regulatory and communications upgrades required to operate in civilian airspace and to ensure interoperability with allies. A project to examine these potential additional requirements for operational relevance reasons is being led by the Royal Canadian Air Force and is currently in Options Analysis.
4. Estimated Life Expectancy 2032: This scenario would see the first aircraft being retired in 2027 and the last aircraft retired in 2032 to coincide with the introduction to a permanent replacement fleet.
- a. Structural work : An engineering analysis conducted earlier this year has revealed, with high confidence that the CF-18 fleet's structural life can be extended with acceptable risk within original cost estimates. At this point, the engineering analysis does not indicate further structural investments would be required.
- b. Sustainment : Sustainment expenses consist of additional spare parts and obsolescence management activities. Obsolescence management estimate assume a significant reduction in the number of F/A-18s flown by other nations thus increasing sustainment costs to Canada.
- c. Interoperability, Regulatory and Capability Upgrades
Any additional requirements for investments in these areas will be examined in the options analysis work the RCAF is currently conducting.
5. Mission Ready from (\$628 million): Increasing the CF-18 mission readiness from consists of increasing both the number of serviceable aircraft and the number of trained pilots to operate the additional fighter capability. The \$628 million estimate has been adjusted for inflation, and would be spent over a period of approximately 12 years. This investment is broken down as follows:
- a. Increasing Serviceability from (approximately The average current serviceability rate of aircraft is achieved/based on of available human resources in the Royal Canadian Air Force and funding for spares and maintenance. It is possible to increase this number by contracting out some second line maintenance capacity to industry to free up qualified CF-18 technicians currently doing this work to increase capacity to support flight or first line maintenance requirements. It is assessed that contracting out this maintenance and purchasing additional parts and would increase aircraft serviceability to an average of by 2020 with low risk.
- b. Increase Number of Pilots Fighter pilot production would need to be increased above current numbers to fly the additional mission ready aircraft. This would be done by utilizing allied training capacity with a one-time investment of approximately to be spent between 2017 and 2023. This measure

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would provide the required number of pilots by the end of 2020 and would also have the benefit of mitigating transition risks to a future fighter capability.

CONCLUSION

6. Necessary steps to extend the life of the CF-18 fleet to 2025 using the \$404 million are under way. As the CF-18 extension was required under all options, initial orders have been made for items such as spare parts and related expenditures of approximately are forecasted to be spent in Fiscal Year 2017-18. Analysis over the summer indicates that the structural damage is less than anticipated and that all aircraft can be flown and retired at a predicted rate beyond 2025 without additional investment in structural work. Doing so would require an investment to 2032 (when the last legacy aircraft would retire) of in sustainment activities. Finally, an investment of in contracting out second line maintenance work and addition additional pilot production would allow for an increase of mission ready aircraft

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Attachment: Table Summary of Activities and Cost Estimates

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ATIP Request: A-2016-02051

With regard to each one of Canada's CF-18 Hornets, as of 27 April 2017: (a) each aircraft's number; (b) current age (in years); (c) current airframe hours; (d) expected airframe hours at retirement; (e) year expected to be retired; (f) the start (or expected start) date of the structural upgrade for each aircraft; (g) the completion (or expected completion) date of the structural upgrade for each aircraft; and (h) the start (or expected start) and completion (or expected completion) date for technological upgrades performed as part of the Royal Canadian Air Force's Life Extension Project for each aircraft.

As of 27 April 2017:

(a) Aircraft Number	(b) Current Age (Years)	(c) Airframe Hours	(d) Expected Airframe Hours at Retirement ¹	(e) Year Expected to be Retired ¹	(f) Start (or Expected Start) Date of Each Structural Upgrade	(g) Completion (or Expected Completion) Date of Each Structural Upgrade	(h) Start (or Expected Start) and Completion (or Expected Completion) Date of Each Technological Upgrade
728	32	5383.4		2025			to be determined
729	32	5077.8		2025			to be determined
730	32	5731.7		2025			to be determined
731	32	6572.6		2025			to be determined
734	32	6599		2025			to be determined
735	32	6018.9		2025			to be determined
736	32	6299.9		2025			to be determined
739	32	6667.8		2025			to be determined
740	32	5347.8		2025			to be determined
741	32	5846.7		2025			to be determined
742	32	6392.9		2025			to be determined
743	32	5543.5		2025			to be determined
744	32	6308.3		2025			to be determined
746	32	5946.3		2025			to be determined
748	31	6440.3		2025			to be determined
749	31	5743.1		2025			to be determined
750	31	5457.3		2025			to be determined
751	31	6199.7		2025			to be determined
752	31	6611.4		2025			to be determined
753	31	6007.4		2025			to be determined
754	31	6133.9		2025			to be determined
756	31	6273.8		2025			to be determined
757	31	6347.2		2025			to be determined
758	31	5979.6		2025			to be determined
759	31	6775.9		2025			to be determined
760	31	6080.4		2025			to be determined
761	31	4200.5		2025			to be determined
762	31	5355.8		2025			to be determined
763	31	6128.7		2025			to be determined
766	31	5159.7		2025			to be determined
767	31	6806.9		2025			to be determined
769	30	6725.7		2025			to be determined
770	30	6205.4		2025			to be determined
771	30	6465.4		2025			to be determined
774	30	7046.7		2025			to be determined
775	30	5718.5		2025			to be determined
776	30	5866.7		2025			to be determined
777	30	6594.5		2025			to be determined
778	30	6676.6		2025			to be determined
780	30	6709.6		2025			to be determined
781	30	7072		2025			to be determined
782	30	7315.2		2025			to be determined
783	30	6745		2025			to be determined
784	30	5874.4		2025			to be determined
785	30	6552.5		2025			to be determined
786	30	6963.2		2025			to be determined
787	30	7648.2		2025			to be determined
788	30	6745.9		2025			to be determined
790	30	7104.1		2025			to be determined
791	29	6692.2		2025			to be determined
793	29	6616.6		2025			to be determined
794	29	6415.5		2025			to be determined
795	29	6610.5		2025			to be determined
796	29	4508.1		2025			to be determined
797	29	5488.6		2025			to be determined

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As of 27 April 2017:

(a) Aircraft Number	(b) Current Age (Years)	(c) Airframe Hours	(d) Expected Airframe Hours at Retirement ¹	(e) Year Expected to be Retired ¹	(f) Start (or Expected Start) Date of Each Structural Upgrade	(g) Completion (or Expected Completion) Date of Each Structural Upgrade	(h) Start (or Expected Start) and Completion (or Expected Completion) Date of Each Technological Upgrade
916	32	6926.5		2025			to be determined
917	32	6585.8		2025			to be determined
918	32	5763.1		2025			to be determined
921	31	6853.9		2025			to be determined
923	31	7063.5		2025			to be determined
924	30	7180.2		2025			to be determined
925	30	7454.2		2025			to be determined
926	29	6491		2025			to be determined
927	29	6107.2		2025			to be determined
928	29	6453.6		2025			to be determined
930	29	5904		2025			to be determined
931	29	5835.4		2025			to be determined
932	29	6464.2		2025			to be determined
933	29	6399.7		2025			to be determined
934	29	6521.3		2025			to be determined
935	29	6071.4		2025			to be determined
936	29	5863.2		2025			to be determined
937	29	6233.8		2025			to be determined
938	29	6884.3		2025			to be determined
939	29	6839.9		2025			to be determined
940	29	6401.1		2025			to be determined

¹ Airframe Hours on retirement and year of retirement is dependent on ongoing and future usage, operational requirements, future policy direction, and funding for ongoing in-service support.